



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,122	11/26/2003	Shigeru Sakamoto	50002-018	4842

7590 10/10/2006

MCDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
Washington, DC 20005-3096

EXAMINER
----------

CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
----------	--------------

1745

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding:

**Office Action Summary**

Application No.

10/722,122

Applicant(s)

SAKAMOTO ET AL.

Examiner

Tony Chuo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 28 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. Claims 1 and 4-6 are currently pending. Claims 2, 3, and 7 are cancelled. The objection to the drawings is withdrawn. The objection to the specification is withdrawn. Claims 1 and 4-6 do overcome the previously stated 102 and 103 rejections. However, upon further consideration, claims 1 and 4-6 are rejected under the following 112 and 102 rejections.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how 70% of the fibers are arranged in the same direction while maintaining enough structural integrity of the gas diffusion layer. It is also unclear what "the fiber direction" of the gas diffusion layer refers to. If all the fibers are lined up in one direction, there would be no structural integrity of the gas diffusion layer.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Taniguchi et al (US 6083638). The Taniguchi reference teaches a fuel cell "1" comprising a plurality of basic units "100" that are laminated where each basic unit includes a polymer electrolyte membrane "11", anode "12", cathode "13", a pair of separator plates "20" & "30", current collectors "40" & "41" wherein the anode and cathode each comprise catalyst layers and the current collectors also function as gas diffusion layers (See column 3, lines 25-56). It also teaches current collectors that includes hydrophilic layers "203" that are strip like, parallel to each other and positioned along the centers of the gas channels (See column 12, lines 49-53 and Figure 6b). It also teaches water that almost exclusively goes through the hydrophilic phase and gas that is certainly distributed through the path F2 maintained in the hydrophobic phase (See column 9, lines 28-34). Therefore, reactant gas is restrained from flowing into adjacent gas flow channels because of the strip like hydrophilic layers. It is inherent that if the gas is flowing exclusively in the gas flow channels and not in between the gas flow channels that the generation of water droplets plugging the gas flow channels is suppressed by pressure loss flowing into adjacent gas flow channels that is greater than the pressure loss of reactant blowing away the water in the gas flow channels. As a result of the gas being restricted from flowing in between the gas flow channels by the hydrophilic layers, the gas permeability in the direction perpendicular to the gas flow direction and parallel

to the surface of the separators is smaller than the gas permeability in the gas flow direction and in the lamination direction of the unit cells.

6. Claims 1 and 4-6 are rejected under 35 U.S.C. 102(a) as being anticipated by Taniguchi et al (JP 2003-017091). The Taniguchi reference teaches a cell "13" comprising oxidizer electrode "16b", a fuel electrode "16a", a polyelectrolyte film "14" in between the oxidizer and fuel electrodes, catalyst beds "15a" & "15b" on both sides of the polyelectrolyte film, and separators "12a" & "12b" on both sides of the membrane electrode complex "11" (See paragraph [0030],[0031]). It also teaches carbon fiber comprising the oxidizer electrode and the fuel electrode that is arranged in parallel in accordance with the flow direction of the reactant gas in order to prevent the reactant gas from flowing in between the gas flow paths (See paragraph [0038] and Drawings 3 and 4). It is inherent that if the gas is flowing exclusively in the gas flow paths and not in between the gas flow paths that the generation of water droplets plugging the gas flow paths is suppressed by pressure loss flowing into adjacent gas flow paths that is greater than the pressure loss of reactant blowing away the water in the gas flow paths. As a result of the gas being prevented from flowing in between the gas flow paths, the gas permeability in the direction perpendicular to the gas flow direction and parallel to the surface of the separators is smaller than the gas permeability in the gas flow direction and in the lamination direction of the unit cells. In addition, it also teaches more than 50% of all the gas flow channels that are arranged parallel to the fiber direction of the gas diffusion layer "16a" facing separator "12a" (See Drawings 3 and 6). It is also

Art Unit: 1745

implicit from the teachings of Taniguchi et al that at least 70% of the carbon fibers are arranged approximately parallel to the gas flowing in the separators (See Drawing 3).

### ***Response to Arguments***

7. Applicant's arguments, see Remarks, filed 7/28/06, with respect to the rejection(s) of claim(s) 1-7 under 35 USC 102 and 103 have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new grounds of rejection are made.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's trainer, Susy Tsang-Foster can be reached on (571) 272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Art Unit: 1745

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

A handwritten signature in black ink, reading "Susy Tsang-Foster". The signature is written in a cursive, flowing style.

**SUSY TSANG-FOSTER**  
**PRIMARY EXAMINER**